

IN THE CLAIMS:

Please amend the claims as follows:

1. (Currently Amended) An apparatus for permanently measuring wellbore or formation parameters, comprising:

a casing string permanently located within a wellbore by an alterable bonding material within an annulus between the casing string and a surrounding formation, wherein at least a portion of the casing string comprises a protective pocket attached to an inner surface of the casing string;

at least one ~~optical~~ sensor attached to the casing string, the at least one ~~optical~~ sensor capable of measuring one or more wellbore or formation parameters, wherein the at least one sensor is attached to the casing string by location within the protective pocket; and

~~at least one sensor carrier carried on the casing string, wherein the at least one optical sensor is disposed within the at least one sensor carrier to attach the at least one optical sensor to the casing string.~~

2-7. (Cancelled)

8. (Currently Amended) An apparatus for permanently measuring wellbore or formation parameters, comprising:

a casing string permanently located within a wellbore, wherein at least a portion of the casing string comprises a protective pocket attached thereto; and

at least one optical sensor attached to the casing string, the at least one optical sensor capable of measuring one or more wellbore or formation parameters, ~~and~~ wherein the at least one optical sensor is attached to the casing string by location within the protective pocket, and wherein the protective pocket is disposed around the casing string by a threaded connection.

9. (Canceled)

10. (Currently Amended) The apparatus of claim [[8]] 1, wherein the protective pocket is disposed around an inner surface of the casing string.

11-12. (Cancelled)

13. (Original) The apparatus of claim 1, wherein the one or more wellbore or formation parameters comprises pressure, temperature, seismic conditions, acoustics, fluid composition within a formation, or combinations thereof.

14. (Original) The apparatus of claim 1, wherein a plurality of optical sensors are attached to the casing string.

15. (Withdrawn) The apparatus of claim 14, wherein the plurality of optical sensors attached to the casing string comprise a flow meter.

16. (Withdrawn) The apparatus of claim 14, wherein the one or more wellbore parameters are used to calculate flow rate of drilling fluid flowing through the casing string, one or more component fractions of components present in the drilling fluid, or combinations thereof.

17. (Currently Amended) An apparatus for permanently measuring wellbore or formation parameters, comprising:

a casing string permanently located within a wellbore; and
at least one optical sensor located at least partially within a wall of the casing string, the at least one optical sensor capable of measuring one or more wellbore or formation parameters; and
an optical cable located within the wall of the casing string, the optical cable connecting the at least one optical sensor to a signal interface.

18. (Cancelled)

19. (Original) The apparatus of claim 17, wherein the at least one optical sensor is located completely within the wall of the casing string.

20. (Original) The apparatus of claim 17, wherein the one or more wellbore or formation parameters comprises pressure, temperature, seismic conditions, acoustics, flow rate of drilling fluid, component fractions of components present in the drilling fluid, fluid composition within a formation, or combinations thereof.

21. (Original) The apparatus of claim 17, wherein a plurality of optical sensors are located at least partially within the wall of the casing string.

22. (Withdrawn) The apparatus of claim 21, wherein the plurality of optical sensors located at least partially within the wall of the casing string comprise a flow meter capable of measuring flow rate or component fractions of fluid flowing within the casing string.

23 – 63 (Cancelled)

64. (New) A method of permanently monitoring wellbore or formation parameters, comprising:

providing a casing string having a protective pocket attached to an inner surface of the casing string;

locating the casing string within a wellbore;

setting the casing string permanently within the wellbore with a physically alterable bonding material; and

monitoring a wellbore or formation parameter with a sensor attached to the casing string by location of the sensor within the protective pocket.

65. (New) The method of claim 64, wherein the physically alterable bonding material is cement.

66. (New) The method of claim 64, wherein the sensor includes a seismic sensor.

67. (New) An apparatus for permanently measuring wellbore or formation parameters, comprising:

a casing string permanently located within a wellbore, wherein the casing string defines a substantially uniform inner diameter and a substantially uniform outer diameter across its length;

an alterable bonding material within an annulus between the casing string and a surrounding formation; and

a sensor located at least partially within a wall of the casing string between the inner and outer diameters, wherein the sensor is capable of measuring wellbore or formation parameters.

68. (New) The apparatus of claim 67, wherein the physically alterable bonding material is cement.

69. (New) The apparatus of claim 67, wherein the sensor is attached to an outside of the casing string.

70. (New) The apparatus of claim 67, wherein the sensor is attached to an inside of the casing string.

71. (New) The apparatus of claim 67, wherein the casing string comprises a protective cover that the sensor is located within.

72. (New) The apparatus of claim 1, wherein the physically alterable bonding material is cement.

73. (New) The apparatus of claim 1, wherein the at least one sensor comprises an optical sensor.

74. (New) The apparatus of claim 1, wherein the at least one sensor includes a seismic sensor.

75. (New) The apparatus of claim 1, wherein the at least one sensor includes a circumferential sensor disposed around the inner surface of the casing.